.1752
36P
80

LIBRARY
UNIVERSITY OF MARYLAND
COLLEGE PARK, MD.

THE ECONOMIC IMPORTANCE OF PORT-LINKED MANUFACTURING INDUSTRIES IN THE BALTIMORE METROPOLITAN AREA

MARYLAND STATE PLANNING COMMISSION

THE ECONOMIC IMPORTANCE OF PORT-LINKED MANUFACTURING INDUSTRIES IN THE BALTIMORE METROPOLITAN AREA

MARYLAND STATE PLANNING COMMISSION

MAY 1953

MARYLAND STATE PLANNING COMMISSION
100 Equitable Building
Baltimore 2, Maryland

Publication No. 80

Price 50 cents

MARYLAND STATE PLANNING COMMISSION

James C. Alban, Chairman
Member from Central Maryland

George M. Anderson
State Board of Health

George W. Della
Legislative Council

John B. Funk
Member from Western Maryland

W. Thomas Kemp, Jr.
State Board of Public Welfare

Russell H. McCain
State Roads Commission

Nathan L. Smith
Department of Public Improvements

Thomas B. Symons
Member from Southern Maryland

I. Alvin Pasarew, Director

206517

MARYLAND STATE PLANNING COMMISSION

100 Equitable Building
Baltimore 2, Maryland

GEORGE M. ANDERSON
DAVIS C. BURROUGHS
GEORGE W. DELLA
JOHN B. FUNK
W. THOMAS KEMP, Jr.
RUSSELL H. McCAIN
NATHAN L. SMITH
THOMAS B. SYMONS
JAMES C. ALBAN
Chairman
I. ALVIN PASAREW
Director

May 15, 1953

TO HIS EXCELLENCY
THEODORE R. McKELDIN
GOVERNOR OF MARYLAND

Dear Governor McKeldin:

I am pleased to transmit herewith for your consideration and review the Commission's study on "The Economic Importance of Port-Linked Manufacturing Industries in the Baltimore Metropolitan Area."

The Port of Baltimore is one of the State's greatest natural and man-made assets. To the extent that we can further the understanding of the various segments of the Port's economy, we may be better prepared to cope with the problems presented by changing technology and economic conditions.

A great portion of the study has been based on interviews and information supplied by agencies, firms, and individuals closely connected with the Port. We have analyzed the conditions of port-linkage, and on this basis we have been able to measure the employment and payroll contribution of the various manufacturing industries, classified as completely port-dependent, partially port-dependent, and port-serviced.

It will not come as any great surprise to you to learn that the port-linked establishments in the Baltimore Metropolitan Area contribute almost one-half billion dollars in annual payroll to the Area. Accordingly, in all actions affecting the Port, the State must necessarily be constantly aware of its responsibility in protecting the economic well-being of the citizens of the Area, as well as making conditions favorable for their continued prosperity and security.

Respectfully submitted,

James C. Alban

James C. Alban
Chairman

Digitized by the Internet Archive
in 2010 with funding from
Lyrasis Members and Sloan Foundation

http://www.archive.org/details/economicimportan80mary

TABLE OF CONTENTS

PAGE

INTRODUCTION 1

Definition of Terms 2
Organization 3

I. THE PORT OF BALTIMORE 4

Baltimore's Status as a Port 7
Current Issues Involving the Port 8
Freight Rate Differential 8
Port Charges and Practices 9
Centralized Port Authority 10
Industrial Background 10
Industrial Network 11

II. ANALYSIS OF RELATIONSHIP BETWEEN MANUFACTURING INDUSTRIES AND PORT FACILITIES 13

Manufacturing-Shipping Relationship 13
Conditions Determining Port-Linkage 14

III. COMPLETELY PORT-DEPENDENT INDUSTRIES 20

Primary Metal Industries 22
Bethlehem Steel 22
Other Primary Metal Establishments 25
Chemicals and Allied Products (Industrial and Agricultural) . 25
Industrial Chemicals 26
Fertilizers 27
Products of Petroleum and Coal (Petroleum Refining) 28
Esso Standard Oil Company 28
Transportation Equipment (Shipbuilding and Repairing) 29
Food and Kindred Products (Sugar Refining). 30
Stone, Clay, and Glass Products (Gypsum) 31

IV. PARTIALLY PORT-DEPENDENT INDUSTRIES 32

Food and Kindred Products (excluding Sugar Refining) 33
Fabricated Metal Products (except Ordnance, Machinery, and Transportation Equipment) 35
Chemicals and Allied Products (excluding Industrial and Agricultural) 36
Paints and Pigments 36
Soap and Products 37
Machinery (except Electrical) and Electrical Machinery, Equipment, and Supplies 37
Stone, Clay, and Glass Products (excluding Gypsum) 38
Transportation Equipment (excluding Shipbuilding and Repairing) 40

V. PORT-SERVICED INDUSTRIES 41

TABLE OF CONTENTS (Continued)

PAGE

VI. ECONOMIC IMPACT OF PORT-LINKED MANUFACTURING INDUSTRIES. . . 44

Employment Provided by Port-Dependent and Port-Serviced Industries 44
Employment Provided by Port-Linked Establishments 45
Major Port-Linked Industries, According to Payroll 47
Measurement of Waterborne Commerce 47

VII. OPPORTUNITIES FOR INDUSTRIAL EXPANSION 49

SUMMARY AND CONCLUSIONS 51

BIBLIOGRAPHY. 54

APPENDIX A. Port Development Proposals for 1953 56

TABLES

1. Major Items Imported and Exported by Manufacturing Industries in Baltimore Metropolitan Area 15

2. Distribution of Manufacturing Industry in Baltimore Metropolitan Area, 1951 23

3. Comparison of Employment and Payroll for Port-Linked Establishments in Baltimore Metropolitan Area, 1951 46

FIGURES

1. Port of Baltimore 5

2. Port-Linked Manufacturing Industries in Baltimore Metropolitan Area 21

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

ACKNOWLEDGMENTS

Much of this study is based directly on information supplied by individuals and agencies closely connected with the Port of Baltimore or its manufacturing industries. The Commission wishes to express its sincere thanks to the following persons to whom it is deeply indebted for their generous assistance in the preparation of this study: Mr. Joseph Stanton, Director, Export and Import Bureau, Baltimore Association of Commerce; Mr. George W. Creighton, Director, Industrial Bureau, Baltimore Association of Commerce; Mr. John S. Aler, Jr., Manager, Steamship Trade Association of Baltimore; Mr. James W. Davis, Executive Director, Port of Baltimore Commission, Mr. John Weber, District Manager, Baltimore Field Office, U. S. Department of Commerce; Mr. Michael Murray, Chief, Commercial Statistics Section, Baltimore District Headquarters, U. S. Army Corps of Engineers; Mr. J. Eugene Kennedy, Assistant Collector of Customs, Baltimore; Mr. Henry F. Tyson, Deputy Collector in Charge of Outside Activities, Baltimore; Mr. Samuel Shapiro, Customs Broker, Mr. W. H. Long, Public Relations Director, Baltimore Esso Refinery; Mr. Charles E. McLaughlin, Public Relations Director, Mathieson Chemical Company, and Mr. Yale Merrill, Public Relations Director, Bethlehem Steel Company, Sparrows Point. Special acknowledgment is due Mrs. Gladys N. McDermott, Labor Market Analyst, Maryland Department of Employment Security, and her associates for the time and effort expended by them in assembling the employment and payroll data contained in this study.

This study was carried out by Mrs. Thelma S. Nason, Research Analyst, under the supervision of Mr. I. Alvin Pasarew, Director, and Mrs. Shirley F. Weiss, Economist.

INTRODUCTION

The Port of Baltimore has been described as the City's most valuable asset. Although this statement cannot be challenged, the economic significance of the intimate relationship between the Port and a number of the Metropolitan Area's largest industries must also be recognized. These industries, while dependent on the uninterrupted operation of the Port for their economic well-being, are in turn major contributors to the Port's continued growth and prosperity.

This study was undertaken in order to gain insight into the complex economic structure which underlies Baltimore's development as an industrial and maritime center, and to isolate and define the salient factors in this manufacturing-shipping relationship.

Valuable spadework has already been done by several interested agencies. Chief among these agencies are the Baltimore Association of Commerce, the United States Department of Commerce (Baltimore Field Office), and the Consolidated Gas and Electric Company. (See Bibliography.) A comprehensive survey of the Port of Baltimore was prepared by the Knappen Tippetts Abbett Engineering Company in 1949 under the joint sponsorship of the Baltimore Association of Commerce, the City of Baltimore, and the State of Maryland.

However, these earlier studies primarily concentrated either on the Port and activities directly related to it or manufacturing. Since Baltimore's economic growth has depended largely on both of these activities, the present need is to examine the economic and technological conditions dictating the relationship of the manufacturing industries to the Port. This study hopes to provide the basis for a coordinated developmental program encompassing the needs of both the Port and the manufacturing industries using its facilities.

Definition of Terms

For the purposes of this study, the definition of "manufacturing industries" given in the Standard Industrial Classification Manual is used.[1] The classification of the manufacturing industries into appropriate categories is also in accordance with the above manual.

The area covered by this study is limited to the Baltimore Metropolitan Area, which includes Baltimore City, Baltimore County, and Anne Arundel County, as defined by the U. S. Bureau of the Census.

The terms imports and exports are carefully limited in usage to goods coming from or going to foreign lands: receipts and shipments and inbound and outbound shipments cover all cargoes, both foreign and domestic.

Port-linked is a broad term covering all manufacturing industries utilizing the Port in the conduct of their business to a greater or lesser extent. Port-linked industries may be either port-dependent or port-serviced.

Port-dependent is used in referring to those manufacturing industries which rely heavily upon water transportation for the receipt and shipment of goods and which would be handicapped without easy access to water transportation. These industries are later classified as completely or partially port-dependent.

Port-serviced is used to refer to the balance of port-linked industries, which benefit from the Port facilities but do not rely on water transportation.

---

[1] Bureau of the Budget, Standard Industrial Classification Manual, "The manufacturing division includes those establishments engaged in the mechanical or chemical transformation of inorganic or organic substances into new products and usually described as plants, factories, or mills, which characteristically use power-driven machines and materials-handling equipment. Establishments engaged in assembling component parts of manufactured products are also considered manufacturing if the new product is neither a structure nor other fixed improvement." Vol. 1, part 1 (Washington, Government Printing Office, 1945), p. 3.

Organization of Study

The material in this report is organized around two major themes:

1. The relative importance of the Port of Baltimore to the various manufacturing industries.
2. The economic importance of the port-linked manufacturing industries and establishments to the Port and the community at large.

I. THE PORT OF BALTIMORE

The Port of Baltimore, a large and bustling harbor, is probably the single most important asset of the City of Baltimore in terms of the industry, commerce, and employment it has stimulated, both directly and indirectly. The Port is located on the Patapsco River which empties into Chesapeake Bay. Unlike other ports, Baltimore has two exits to the ocean: the more heavily used one is through the Chesapeake Capes, approximately 150 nautical miles away; while the other exit, which foreshortens the sea voyage to other North Atlantic ports, is through the Chesapeake and Delaware Ship Canal, a distance of approximately 125 nautical miles.1/

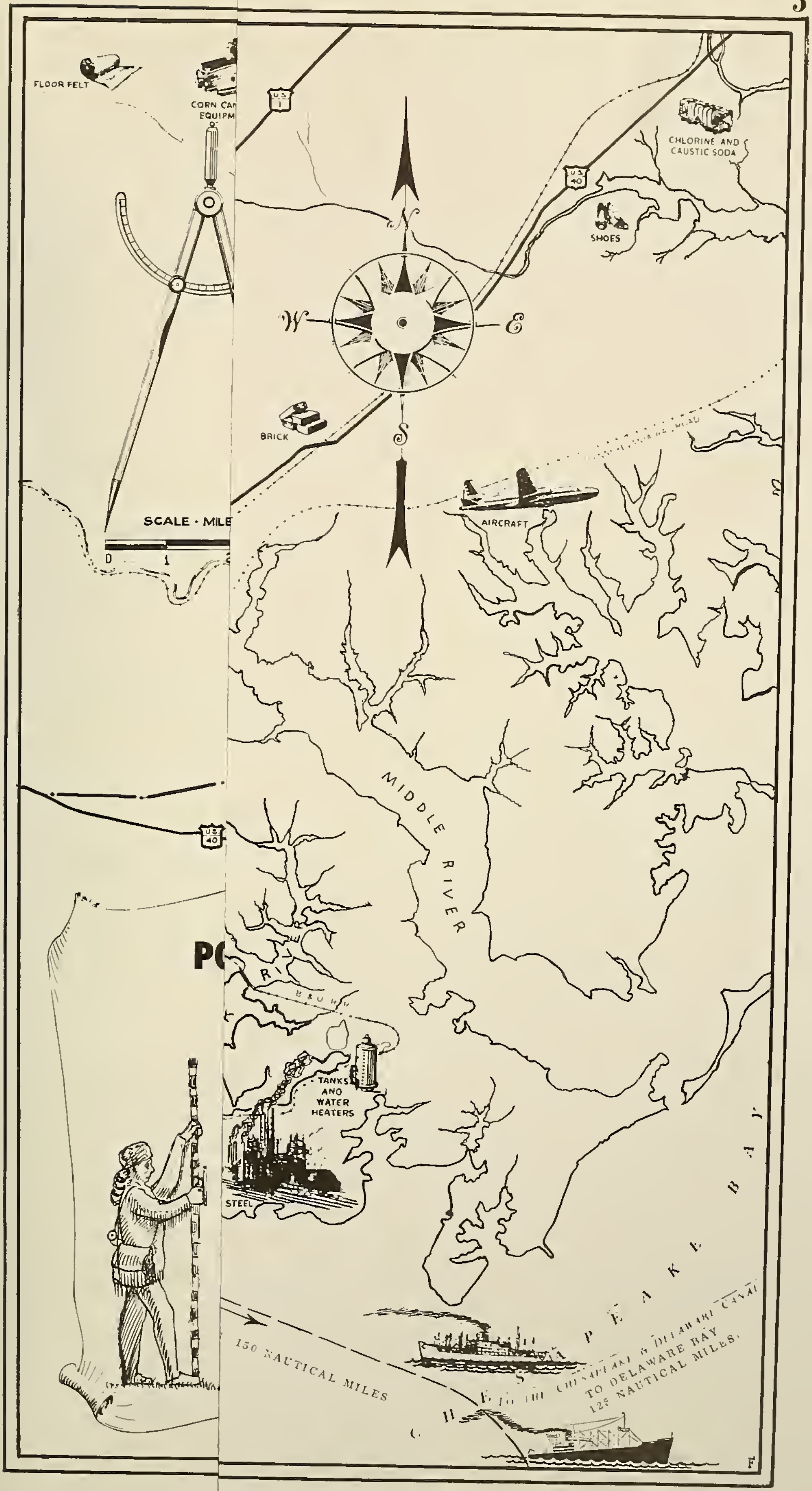
The shipping piers, railroad terminals, and auxiliary harbor facilities, as well as a number of large industrial plants, are located on a 40-mile waterfront which divides naturally into four main sections: the Northwest or Inner Harbor; the Middle Branch; Curtis Bay and Curtis Creek; and the Lower Patapsco River. The food processing companies and the closely allied can manufacturers are located mainly in the Inner Harbor area, whereas a number of the fertilizer and chemical works are centered in the Curtis Bay area. Other industrial establishments are scattered throughout the Harbor.

The Port of Baltimore primarily handles 'bulk' cargo, that is, cargo which does not require packing for shipment or is generally moved in large volumes. Grain, coal, petroleum, ores and metals, iron and steel products, fertilizers, molasses, sugar and lumber comprise the bulk cargo trade of the Port and usually total over 75% of the total tonnage passing annually through the Port.

The development of Baltimore as a bulk cargo port stems mainly

---

1/ An approved program of improvements to the canal includes the ultimate deepening to 32 feet with a 350-foot bottom width.



1-

d

han

g-

-

for

er-

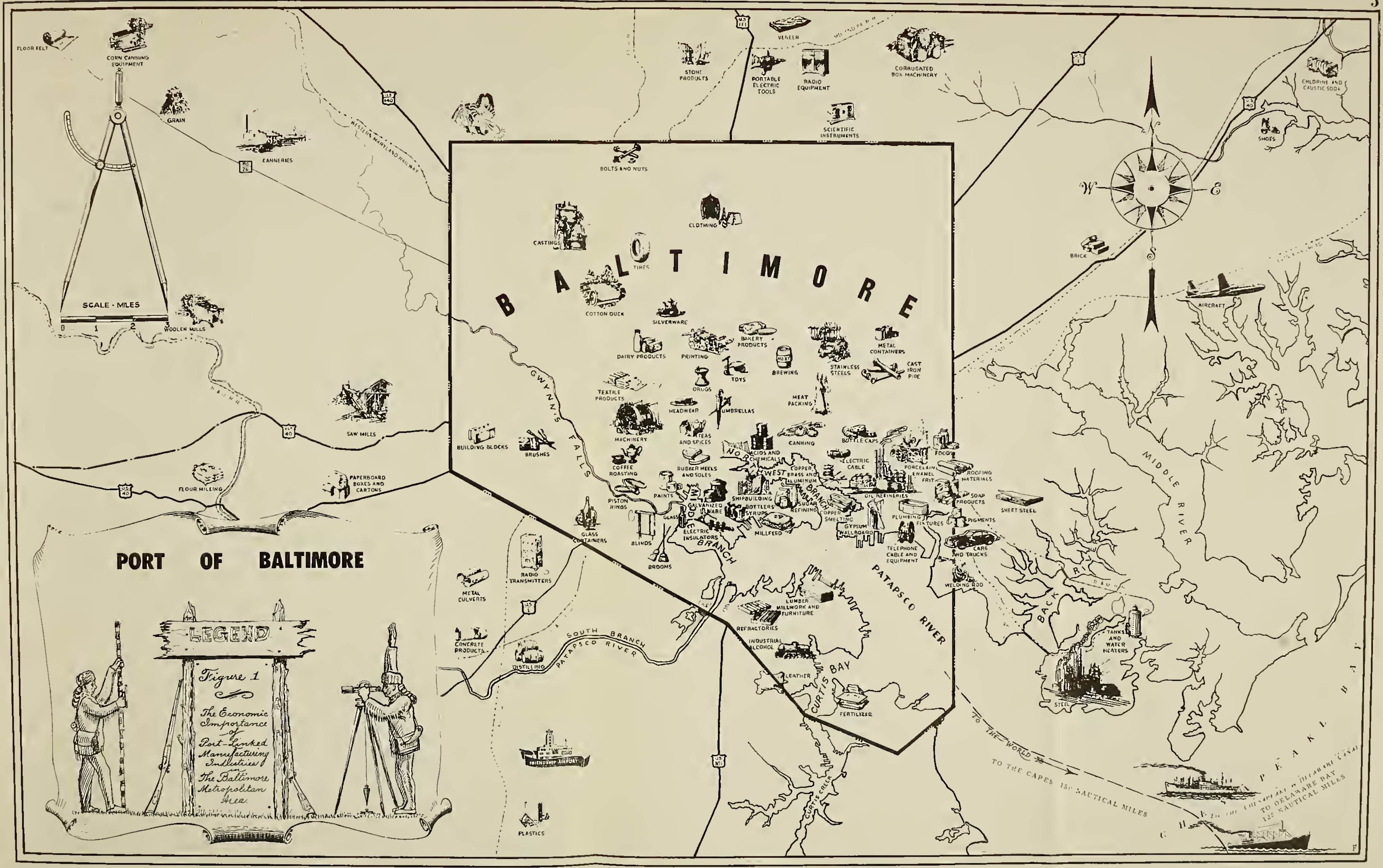
ely

he

re-

---

of
42



PORT OF BALTIMORE

LEGEND

Figure 1

The Economic Importance of Port-Linked Manufacturing Industries in The Baltimore Metropolitan Area from the favorable railroad freight rate differential which Baltimore enjoys as compared to the other North Atlantic ports, namely, Boston, New York, and Philadelphia. The schedule of differentials for exports and imports moving through the Central Freight Association Territory is as follows:[1]

	Export Differentials in Cents Per 100 lbs.						Import Differentials in Cents Per 100 lbs.					
	Class						Class					
	1	2	3	4	5	6	1	2	3	4	5	6
Boston; New York	0	0	0	0	0	0	0	0	0	0	0	0
Philadelphia	2	2	2	2	2	2	6	6	2	2	2	2
Baltimore	3	3	3	3	3	3	8	8	3	3	3	3

The lower rates also apply on intercoastal freight shipped to or received from the Pacific Coast.

Baltimore is closer by 50 to 150 miles to Midwestern centers than the North Atlantic ports, hence the favorable freight differential. Originally established in 1877 by agreement between the main trunk line railroads serving the Eastern seaboard, the differential has been in effect for over 75 years.

In contrast to the usual practice of public or independent ownership of shipping piers, the large marine terminals in Baltimore are largely owned by the railroads servicing the Port. While direct rail connection with the piers eliminates cumbersome and costly operations involved in the transfer of cargo from ship to rail as practiced in other ports, it has created certain other problems which will be discussed subsequently.

---

[1] The Baltimore Association of Commerce and Steamship Trade Association of Baltimore, Port of Baltimore Handbook (second edition) March 1952, p. 42.

Baltimore's Status as a Port

Baltimore, according to its well-wishers, is the second ranking foreign trade port in the United States, outdistanced only by New York. However, any attempt to rank the leading ports in the United States in descending order of importance usually provokes disagreement. Such disagreement is occasioned by the question of definition. On this subject, a recent article in Business Week pointed out: "Are you talking about tonnage or dollar value? About a single port or an entire customs district? About imports or exports, or the sum of the two? About foreign trade only, or total trade including coastal, intercoastal, intraport and inland waterways?"1/

In terms of volume of foreign trade, Baltimore ranks second to New York, with 22,446,167 short tons in 1951. However, Baltimore rated third place in 1951 in terms of total waterborne traffic, with a total of 42,923,012 short tons.2/

The importance of foreign trade to the Port is underscored by noting that of the total tonnage handled in 1951, 53% was attributable to foreign trade. Imports were almost double the amount of exports and constituted approximately two thirds of the foreign trade tonnage. For the remaining traffic, coastwise trade was 21% of the total tonnage, internal 10%, and local 16%.3/

Baltimore's coastal and intercoastal trade is less in volume than that handled at other North Atlantic ports. During World War II, coastal traffic declined precipitously owing to the hazards of wartime shipping,

---

1/ Business Week, "Ports in a Storm," November 22, 1952, p. 84.

2/ Department of the Army, Chief of Engineers, Annual Report, 1952, data not yet published.

3/ Ibid.

but it has since regained its earlier volume. However, the nature of the traffic has changed somewhat with a decline in general and miscellaneous cargo and a rise in the volume of bulk cargo.

The decline of general cargo in coastal traffic is generally attributed to the substitution of all-rail and truck transportation for water or combined water-rail transportation in the interest of fast transportation. Rising water shipping costs have accentuated the trend in this direction.1,2/

Current Issues Involving the Port

With the exception of the years covered by World War II, the Port of Baltimore has shown a steady growth. However, a number of problems have arisen which may well affect the future of the Port.

Most pressing is the competitive leadership exhibited by the other North Atlantic ports in their fight to attract a larger share of the total United States shipping trade. This fight is being conducted on a number of fronts.

Freight Rate Differential. The favorable differential which Baltimore enjoys on iron ore and grain, two major items in its foreign trade, is currently being threatened by the campaign of competing ports and the railroads serving them in cases pending before the Interstate Commerce Commission. It is likely that the fight to remove the differential on ores and grain will be extended to all differentials should the opening skirmish be won.

1/ Based on interview with Mr. Michael Murray, Chief, Commercial Statistics Section, Baltimore District Headquarters, U. S. Army Corps of Engineers, December 3, 1952.

2/ Knappen Tippetts Abbett Engineering Company, Report on the Port of Baltimore, 1950, vol. 1, p. 10.

Port Charges and Practices. New York, Philadelphia, and the Hampton Roads area have all begun to offer favorable concessions on port charges and practices in order to attract additional general and bulk cargo. To date, no such action has been taken by Baltimore interests. The railroad ownership of docking space in Baltimore has resulted in discrimination against the generalcargo hauled by trucks, both in terms of facilities provided for trucks at most piers, and the charges and practices in force for truck freight.

General cargo constitutes a smaller percentage of total foreign trade in Baltimore than in other competing ports. In addition, general cargo as a percentage of Baltimore's coastal trade has declined in the postwar years. Yet general cargo is very desirable for the shipping lines because it yields higher revenues by weight than bulk cargo; it requires additional labor for handling; it attracts additional ships with direct sailings to the port; and thereby serves as an additional stimulus for port commerce.

The Knappen Tippetts Abbett report estimated that "About 2,800,000 tons of foreign general cargo carried by the railroad bypassed this Port in 1947," and "since it is estimated that trucks move only about 20% of the total general cargo to Baltimore piers compared with as much as 50% at some competitive ports, it is apparent that the Port is also losing general cargo transported by trucks. It is estimated that an increase of 2,500,000 tons of foreign general cargo per year could be secured by concerted effort."[1] The report recommends improved trucking facilities on the waterfront and the discontinuance of discriminatory charges and practices.

Local manufactures, if expanded along the lines subsequently discussed in this report, could also provide a rich source for general cargo.

1/ pp. 47-48.

Centralized Port Authority. At present, the various functions involved in administering the Port of Baltimore are divided among a number of public and private agencies in contrast to other ports where the responsibilities have been delegated to one central port authority. The present Port of Baltimore Commission, while serving the valuable function of encouraging private development of Port facilities through capital loans at lowered interest rates and favorable tax concessions, is limited primarily to this function.1/

The favorable experience of other ports gives evidence of the value of concentrating developmental, administrative and promotional activities in one port body. A unified approach to the currently pressing port issues, combined with an imaginative program for waterfront development encompassing shipping, industrial, and commercial needs, would undoubtedly benefit the Port and the community as a whole.

Industrial Background

Metropolitan Baltimore in 1950 had a population of 1,337,373, which represented 57.1% of the 2,343,001 inhabitants of the State of Maryland. The City's civilian labor force totaled over one-half million (556,695), or 59.3% of the 938,305 persons in the State's labor force. The Metropolitan Area contained 1,924 manufacturing plants employing 157,592 workers, or 70.6% of the 223,201 employed in manufacturing occupations in the State.2/

The Baltimore Association of Commerce estimates that the value added by manufacture in 1950 was $1,149,605,000, or 79.0% of the

---

1/ See Appendix A for "Port Development Proposals for 1953."

2/ Population and labor force data from 1950 U. S. Census of Population. Data on number of manufacturing establishments obtained from fourth quarterly report, 1950, Department of Employment Security, State of Maryland.

$1,455,095,000 for the whole State.[1] The 1947 figure for the Metropolitan Area was $899,534,000.[2]

Manufacturing plants in Baltimore are predominantly medium- and small-scale operations according to modern industrial standards. In 1947, only 58 firms of the total of 1,785, employed 500 or more workers and of these, only 31 employed 1,000 or more.[3]

The leading industries in terms of size of work force and payroll are the primary metal industries, transportation equipment, food and kindred products, apparel and related products, and fabricated metal products. In the primary metal and transportation equipment industries, a few large companies like Bethlehem Steel and Glenn L. Martin account for the majority of workers employed in the industry group.

Industrial Network

One of the outstanding characteristics of Baltimore as an industrial center is the extent to which the various local manufacturing industries are of service to each other. Industrial activities are surprisingly intermeshed. Certainly this interdependence, or 'industrial network,' as we prefer to call it, is strikingly different from the pattern in many other cities, either the one-industry town as exemplified by Pittsburgh or the city with industrial diversification but little in the way of inter-industry relationships.

In this industrial network, a key position is occupied by the tidewater plant of Bethlehem Steel at Sparrows Point. As the largest metal producer in this area, it distributes its products to a large number of

---

[1] The estimate was computed on the basis of the 27.8% State-wide increase in value added by manufacture between 1947-1950, as estimated by the Bureau of the Census.

[2] Department of Commerce, Census of Manufactures:1947, vol. 3. p. 268.

[3] *Ibid.*, p. 276.

local companies and in turn purchases supplies locally. For example, tinplate produced at Bethlehem Steel is sold to the local can manufacturing companies, which in turn sell their products to the local food processing companies and other establishments using cans and containers. Similarly, the Davison and Mathieson companies sell industrial chemicals, including sulfuric acid, to a number of diversified industrial consumers in the Metropolitan Area, including Bethlehem Steel, Esso Standard Oil, and Western Electric.

This, of course, is not to say that the companies in the Baltimore Metropolitan Area are restricted in the distribution of their products to the local market, but only to point out the existence of a substantial market in the immediate area. Most of the companies in the industrial network are located on or near the waterfront, thus reducing to a minimum the cost of transporting materials from one plant to another.

II. ANALYSIS OF RELATIONSHIP BETWEEN MANUFACTURING INDUSTRIES AND PORT FACILITIES

The Port of Baltimore is economically important to the manufacturing industries located in the Metropolitan Area. With the exception of the tobacco industry, which is insignificant in Baltimore, there are some companies in each of the manufacturing industries which utilize the Port's services.

Manufacturing-Shipping Relationship

The relationship of the Port to the manufacturing concerns is not static. Secular changes in economic, technical, and industrial conditions have either served to increase or decrease the importance of the Port to the various local manufacturers. In certain instances, companies which originally sought a waterfront location, no longer find it to be an important factor in their operations, while others find a harbor location increasingly advantageous.

For example, the Carr-Lowrey Glass Company, founded in 1869, originally selected a waterfront site in order to receive by water the large shipments of hay needed for packing its products. Modern methods of packaging have eliminated the use of hay, and the Company now finds that it utilizes water transportation for little else except coal receipts.

Similarly, the American Smelting and Refining Company, which operates the largest copper refinery in the world, originally located in Baltimore in 1804 to produce refined copper for use in repairing ships' bottoms. Modern technology has replaced copper with other materials for ship repairs. However, the Company continues to find its location valuable because of the proximity of fabricating plants utilizing refined copper.

On the other hand, the passage of time has served to increase the importance of the Port to certain other companies. For instance, the

approaching exhaustion of high quality domestic ferrous ores has increased the economic importance of the tidewater location of the Sparrows Point Steel plant, which is ideally situated to receive shipments of foreign high-grade ores. The growing use of fertilizers abroad, encouraged by United States' aid, has enhanced the economic advantages enjoyed by the chemical and fertilizer companies located on the Baltimore waterfront.

The dynamic relationship between the Port and the local manufacturing industries must therefore be recognized and evaluated in any Port development program.

Conditions Determining Port-Linkage

Firms in every manufacturing industry in Baltimore, with the exception of the almost nonexistent tobacco industry, find their location in the Port advantageous. This is amply illustrated by Table 1 which summarizes the major items imported and exported by the firms which participate in foreign trade. It may be observed from Table 1 that the Port assists local manufacturers in the import of a wide variety of raw materials and semi-finished products, and similarly, the export of a wide variety of finished products.

The extent, however, to which the Port proves essential to each manufacturing industry is dictated by the economic and technological conditions under which individual concerns operate. Some or all of a number of factors as enumerated below can be the determinants insofar as port-linkage is concerned:

1. Raw Materials
    a. Physical description of raw materials - bulky, heavy, light.
    b. Sources of raw materials - near plant, other domestic sources, foreign sources.

TABLE 1

MAJOR ITEMS IMPORTED AND EXPORTED BY MANUFACTURING INDUSTRIES IN BALTIMORE METROPOLITAN AREA

Classification	Products Manufactured	Imports	Exports
Food and Kindred Products	Animal feed, beverages, sugar refining, meat packing, canned food, spices, extracts, coffee, liquors	Raw sugar, spices, nuts, oils, coffee, tea, chocolate	Canned food, meats, liquors, beverages, candy
Textile Mill Products	Cotton duck, synthetic yarns, men's hats, rags, wiping cloths	Straw hat bodies, rags, cotton and wool waste	Hosiery, men's felt hats, rags, batting, cotton waste, cotton duck
Apparel and Other Finished Products	Men's underwear, shirts, clothing, women's wear, bags	Burlap, fabrics	Men's and women's wear, bags
Lumber and Wood Products (Except Furniture)	Lumber, kegs, barrels, tanks	Lumber	Lumber, kegs, barrels, vats
Furniture and Fixtures	Venetian blinds, store fixtures, bed springs, window shades, metal cabinets	Holland shade cloth	Venetian blinds, store fixtures
Paper and Allied Products	Paperboard boxes, cases	Woodpulp, transparent bags	Boxes, cases, straws
Printing, Publishing, and Allied Industries	Commercial printing, books, periodicals	Newsprint, paper	Labels, books, periodicals
Chemicals and Allied Products	Sulphuric acid, fertilizers, chrome chemicals, drugs, paints, pigments, soap, and products	Sulphur, fertilizer materials, chrome ore, waxes, copra, drugs, barytes	Sulphuric acid, fertilizers, industrial chemicals, chrome chemicals, paints, and pigments
Products of Petroleum and Coal	Petroleum products, asphalt and products	Crude petroleum and products	Petroleum products, asphalt and products

TABLE 1 (CONTINUED)

Classification	Products Manufactured	Imports	Exports
Rubber Products	Rubber heels, soles, tires tubes	Crude rubber	Rubber heels, soles, tires, tubes
Leather and Leather Products	Ladies' slippers, leather goods	Hides, tanning barks	Ladies' slippers, leather goods
Stone, Clay, and Glass Products	Glass bottles, glass, refractory brick, porcelain frit, porcelain electrical insulators	Refractory ovens, chrome ore, magnesite	Glass bottles, refractory bricks, porcelain insulators
Primary Metal Industries	Iron and steel mill products, copper and copper-mill products, silver, gold, stainless steel	Iron ore and concentrates, chrome ore, manganese ore, copper, chemicals, fluxes	Iron and steel mill products, refined copper and products, stainless steel
Fabricated Metal Products (Except Ordnance, Machinery, and Transportation Equipment)	Bottle tops, tin food containers, plumbing fixtures, steel drums	Cork, paper pulp, antimony, potash	Bottle tops, tin food containers, plumbing fixtures
Machinery (Except Electrical)	Coke and water gas manufacturing apparatus, dredges and machinery, canning, baking, and bottling machinery	Copper tubing, food processing equipment	Coke and water gas manufacturing apparatus, canning and bottling machinery, dredges and machinery
Electrical Machinery, Equipment, and Supplies	Telephone apparatus, radios, radar equipment, portable electric tools, welding wires, electrodes	Jute, rubber, lead, commutators for electric motors	Portable electric tools, radio, radar equipment, welding wire, electrodes
Transportation Equipment	Aircraft, ships and repairing, auto parts, locomotive equipment	Boats, marine engines	Aircraft and parts, autos and parts, ships and repairing

TABLE 1 (CONTINUED)

Classification	Products Manufactured	Imports	Exports
Professional, Scientific, and Controlling Instruments	Meteorological instruments, mine and air conditioning	Anemometer parts	Meteorological instruments, pharmaceutical closures
Miscellaneous Manufacturing Industries	Paint brushes, brooms, umbrellas, toys, plastic items, metal tags	Hog bristles, umbrella frames, handles, broom corn	Paint brushes, brooms, umbrellas, toys, plastic items.

Sources: Baltimore Association of Commerce, Classified Directory of Baltimore Firms in International Commerce, 1951. Maryland Department of Labor and Industry, Directory of Maryland Manufacturers, 1949, 1950.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

2. Finished Products
    a. Physical description of finished product - bulky, heavy, light.
    b. Major markets for finished product - local, domestic, foreign.

3. Transportation
    a. Transportation cost for raw materials and/or finished products; proportion of total cost of production.
    b. Time consumed by transportation; special treatment of commodity during transportation, i.e. refrigeration, etc.

4. Water Supply
    a. Water requirement for industrial processes - unusually large, average, negligible.

5. Relationship to Other Industries
    a. Degree of dependency on another industry for materials or market.

6. Physical Location of Plant
    a. Plant site determined by the unique characteristics of product - ships, seaplanes, etc.

A more succinct way to summarize the determining factors in port-linkage is to ask: Can the industry continue to operate in the event of a harbor shutdown? Certain industries, cut off from their normal supply of raw materials through the Port,would face an almost immediate shutdown. Others could continue to operate for a longer period without a slowdown or suspension of operations; a third group could operate indefinitely despite the tie-up of marine shipping.

On the basis of the above factors, the port-linked industries tend to cluster into three major categories: (1) completely port-dependent; (2) partially port-dependent; (3) port-serviced. In the following sections, brief descriptions of the various industries in each category are offered together with the pertinent statistics. The major emphasis is on the operational factors determining the degree of port-linkage, including inter-industry relationships. Various Baltimore firms are used as specific

illustrations. In a few instances where one or two companies make up the industry, the industry is described by a more complete discussion of the company or companies involved.

III. COMPLETELY PORT-DEPENDENT INDUSTRIES

The industries in this category are completely dependent on the ontinuance of normal port activities for uninterrupted plant operations. The conditions governing the operations of these industries are described by some or all of the following:

1. Raw materials are bulky.
2. Raw materials are obtained solely or substantially from foreign sources, or at a considerable distance from Baltimore.
3. Finished products are bulky.
4. Foreign and domestic markets accessible by water transportation constitute a significant outlet for finished products.
5. Transportation costs for raw materials and/or finished products are an important cost consideration.
6. Industrial processes consume unusually large quantities of water.
7. Manufacturing processes require a tidewater location, i.e. shipbuilding and repairing.

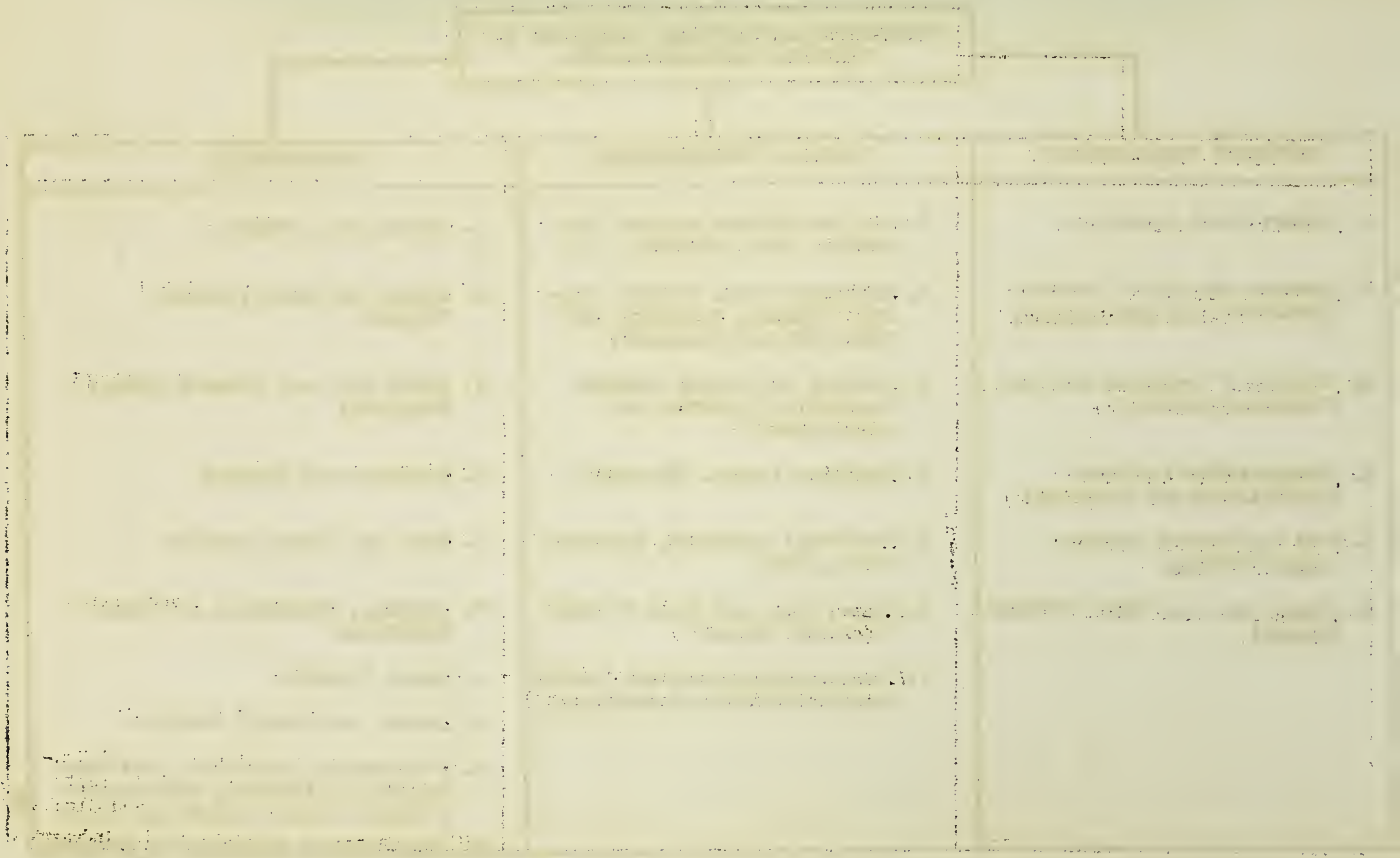
There are three major completely port-dependent industries in Baltimore: primary metals, chemicals (industrial and agricultural), and petroleum. These three serve as the foundation for Baltimore's industrial network.

Three other manufacturing industries are completely port-dependent. These include sugar refining (food and kindred products); gypsum products (stone, clay, and glass industry); and shipbuilding and repairing (transportation equipment industry).

FIGURE 2

PORT-LINKED MANUFACTURING INDUSTRIES IN
BALTIMORE METROPOLITAN AREA

COMPLETELY PORT-DEPENDENT	PARTIALLY PORT-DEPENDENT	PORT-SERVICED
1. Primary Metal Industries	1. Food and Kindred Products (excluding Sugar Refining)	1. Textile Mill Products
2. Chemical and Allied Products (Industrial and Agricultural)	2. Fabricated Metal Products (except Ordnance, Machinery, and Transportation Equipment)	2. Apparel and Other Finished Products
3. Products of Petroleum and Coal (Petroleum Refining)	3. Chemical and Allied Products (excluding Industrial and Agricultural)	3. Lumber and Wood Products (except Furniture)
4. Transportation Equipment (Shipbuilding and Repairing)	4. Machinery (except Electrical)	4. Furniture and Fixtures
5. Food and Kindred Products (Sugar Refining)	5. Electrical Machinery, Equipment and Supplies	5. Paper and Allied Products
6. Stone, Clay, and Glass Products (Gypsum)	6. Stone, Clay, and Glass Products (excluding Gypsum)	6. Printing, Publishing, and Allied Industries
	7. Transportation Equipment (excluding Shipbuilding and Repairing)	7. Rubber Products
		8. Leather and Leather Products
		9. Professional, Scientific, and Controlling Instruments; Photographic & Optical Goods; Watches and Clocks
		10. Miscellaneous Manufacturing Industries



Primary Metal Industries

The primary metal industries are the largest employer in the Metropolitan Area, providing jobs for 16.4% of all employees in local manufacturing. Forty-three establishments employing 31,260 workers had a total payroll of $122,236,169 in 1951. (See Table 2.) Among the major Baltimore companies in this industry are: Bethlehem Steel, Eastern Stainless Steel, Armco Steel (Rustless Division), American Smelting and Refining, and Revere Copper and Brass. Two of the companies have waterfront sites.

Iron and steel manufactures represent the most important products in the primary metal industry, with Bethlehem Steel as the largest single producer.

Bethlehem Steel. The Sparrows Point plant of the Bethlehem Steel Company, located on the Patapsco River, has been rated as the second largest steel plant in the United States and the largest on tidewater.

The Company is the largest single employer in the Metropolitan Area with 25,000 working in the steel plant, and another 10,000 distributed in its other facilities: shipyard, ship repair, scrap metal, etc. It has an estimated annual payroll of about $100,000,000.

The plant is a self-contained, fully-integrated industrial organization with a steel-making capacity of six million tons per year.[1] It is completely equipped with facilities for receiving, conveying, refining, and processing raw materials into a wide variety of finished steel products, including steel plate used in the shipyard located on the plant grounds.

Raw materials utilized in the steel-making process are: coal, limestone, iron ore, manganese, chrome, scrap, and other ferro-alloys. The huge quantities of raw materials consumed in the steel-making process are

---

1/ The Company plans an additional increase in ingot capacity of 2 million tons. Baltimore Evening Sun, February 27, 1953.

TABLE 2

DISTRIBUTION OF MANUFACTURING INDUSTRY IN BALTIMORE METROPOLITAN AREA, 1951

Classification	Units+		Employment*		Payroll	
	Number	% Total	Number	% Total	Value	% Total
Food and Kindred Products	302	15.4	22,159	11.6	$ 72,579,527	10.6
Tobacco Manufactures	4	0.2	118	0.1	298,399	**
Textile Mill Products	30	1.5	3,921	2.1	11,404,024	1.7
Apparel and Other Finished Products	329	16.8	17,559	9.2	46,371,867	6.8
Lumber and Wood Products	92	4.7	2,003	1.0	6,249,625	0.9
Furniture and Fixtures	96	4.9	4,546	2.4	13,411,489	2.0
Paper and Allied Products	47	2.4	4,012	2.1	12,986,082	1.9
Printing, Publishing, and Allied Industries	262	13.3	9,091	4.8	34,311,046	5.0
Chemicals and Allied Products	148	7.5	10,442	5.5	39,616,650	5.8
Products of Petroleum and Coal	13	0.7	2,090	1.1	10,265,554	1.5
Rubber Products	9	0.5	1,596	0.8	8,800,553	1.3
Leather and Leather Products	24	1.2	1,475	0.8		
Stone, Clay, and Glass Products	66	3.4	5,863	3.1	20,790,293	3.0
Primary Metal Industries	43	2.2	31,260	16.4	122,236,169	17.8
Fabricated Metal Products	168	8.6	16,028	8.4	57,121,918	8.3
Machinery (except Electrical)	121	6.2	9,988	5.2	38,561,043	5.6
Electrical Machinery, Equipment, and Supplies	30	1.5	11,490	6.0	47,168,640	6.9
Transportation Equipment	65	3.3	32,420	17.0	127,183,988	18.6
Instruments and Related Products	25	1.3	1,422	0.7	4,742,457	0.7
Miscellaneous Manufactures	90	4.6	3,647	1.9	10,943,517	1.6
Total Manufacturing	1,964	100.0	191,130	100.0	$685,042,846	100.0

Note: Figures may not total 100.0% because of rounding.

* Average for 1951.
+ Fourth quarter, 1951.
** Less than .05%.

Source: Maryland Department of Employment Security.

indicated by the Company's estimate that for every ton of finished steel, five tons of raw materials must be brought in by water or rail. On the basis of the Company's present ingot capacity, it is estimated that 30,000,000 tons of raw materials are consumed annually. These figures underscore the importance of transportation facilities as a fundamental factor in plant location.

Coal and limestone are brought in by rail from near-by Pennsylvania and West Virginia. The Company relies solely on foreign sources for iron ore, finding it cheaper to import high-grade iron ore than to use the low-grade iron ore now available domestically. Iron ore is mainly imported from South America, West Africa, and Sweden. Bethlehem recently invested in the development of Venezuelan ore fields, receiving its first shipment in 1951.

The ore is delivered to the Company's huge, well-equipped ore dock by a fleet of eleven company-owned carriers built at the Sparrows Point shipyard, as well as a number of chartered vessels.

The Company distributes its products locally, as well as to other sections of the country and abroad. The plant is served by a terminal switching line, the Patapsco and Back Rivers Railroad. In addition to providing a direct connection to the main trunk railroads serving Baltimore, the terminal line enables direct transportation of steel products to local customers in the vicinity of Sparrows Point. Products are also shipped out directly from the Company's docks to other coastal ports. The availability of cheap water transportation enables Bethlehem Steel to compete with steel mills in Utah and California for West Coast business and to minimize the transportation costs in shipping to foreign countries.

Part of the Company's daily requirement of 550,000,000 gallons of water for industrial processes is taken from the Patapsco River.

The continued expansion of the Bethlehem Steel plant and the erection of a new tidewater plant by United States Steel in Morrisville, Pennsylvania demonstrate the economic advantages of a coastal port site for steel plants.

Other Primary Metal Establishments. Both Armco Steel and Eastern Stainless Steel produce stainless steel and products. Armco imports most of its raw materials, including chrome ore, and distributes its finished products mainly in Baltimore and other East Coast cities. Eastern meets its steel requirements by local purchases. Both companies are also exporters of finished products.

The cheapest means of transporting the raw materials used in the local copper refinery of American Smelting and Refining is by combined water-rail movement. The copper blister is shipped East via rail to Norfolk and then delivered to the Company's piers in Baltimore by barge. Revere Copper and Brass and Western Electric are two of the large local consumers of refined copper.

Chemicals and Allied Products (Industrial and Agricultural)

Ranking seventh in local employment, the chemical industry relies heavily on facilities afforded by the Port. A total of 148 establishments employed 10,442 workers in 1951, with an annual payroll of $39,616,650.

The local industry, which accounts for 5.5% of manufacturing employment in Baltimore, produces a wide variety of items; the major products are industrial chemicals, fertilizers, paints and pigments, soap and products. Among the leaders are Davison Chemical, Mathieson Chemical, Mutual Chemical, United States Industrial Chemical, National Plastics, and Lever Brothers. Fourteen of the companies, including twelve of the large industrial chemical and fertilizer companies, are located directly on the waterfront. Only the industrial and agricultural segments of the chemical industry may be

classified as completely port-dependent.

Industrial Chemicals. Among the most important industrial chemicals manufactured in Baltimore are sulfuric acid, alcohol, chrome chemicals, and petroleum catalysts. Sulfuric acid ranks first among industrial chemicals. It is essential to the production of fertilizers, chemicals, and refined petroleum. It is also used in the iron and steel industry, textile processing, and the manufacture of explosives, rayon and cellulose, paints and pigments, and synthetic detergents. The importance of sulfuric acid to Baltimore's industrial network cannot be overstated.

The seven plants in Baltimore producing sulfuric acid have a combined capacity of 804,953 tons, or approximately one tenth of the total United States capacity as of 1948.1/ Mathieson, Davison, and Baugh are the leading local producers.

Because of the high cost of land transportation, the companies receive raw materials and ship finished products by water. Sulfur is brought in from the Gulf Coast by boat. Sulfuric acid is shipped out by rail, truck, and barge, usually on short hauls. It is more economical to build new plants at large industrial centers utilizing sulfuric acid than to transport the acid for long distances.2/ In fact, 12% of the sulfuric acid produced at Mathieson is distributed to local consumers through pipelines. Large quantities are shipped by barge to Norfolk, where several large fertilizer plants are located. Of the 547,966 short tons of sulfuric acid shipped through Baltimore in 1951, 495,263 short tons were destined for delivery at points along the Chesapeake Bay and the local harbor.

1/ Interview with Mr. Charles E. McLaughlin, Public Relations Director, Mathieson Chemical Company, December 17, 1952.

2/ Ibid.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

The industry's water requirements also necessitate a waterfront site. Seventy thousand gallons of water are required to make one ton of sulfate pulp.[1/]

Other manufacturers of industrial chemicals dependent on imported raw materials are the United States Industrial Chemical Company, which produces alcohol from imported molasses; and the Mutual Chemical Company, the world's largest producer of chrome chemicals. Both companies are located on the waterfront.

Fertilizers. Baltimore is an important center for the manufacture and shipment of fertilizers and materials. Aside from sulfuric acid, which is obtained locally, the industry depends heavily on phosphate rock brought in by coastal vessels from Florida; potash and nitrogenous materials from foreign sources. Such large fertilizer plants as Mathieson and Davison generally receive shipments of raw materials directly at their own piers, although outbound shipments are ordinarily first moved by rail or barge and lighter to general cargo piers.

The market for agricultural chemicals is expanding both at home and abroad. The domestic market for the Baltimore firms centers around the Middle Atlantic States. Increasing amounts are going to foreign consumers, particularly in Far Eastern countries.

The importance of water transportation to the industrial chemical and fertilizer companies is emphasized by the following facts. The Mathieson Company in 1950 estimated that about 25 ships per year, carrying 10,000-ton cargoes, were used to deliver sulfur and phosphate rock to its Baltimore plant. Exports in turn were loaded on 60 ocean vessels, 108 coastal vessels, and 140 barges. The Davison Company estimates that it used

---

[1/] National Association of Manufacturers, Water in Industry, New York, 1950.

water transportation for 400,000 tons of raw materials annually, which if divided among ships with 10,000-ton capacity would involve 40 ships a year.

Products of Petroleum and Coal (Petroleum Refining)

The petroleum and coal products industry is a relatively small employer in Baltimore. In 1951, a total of 13 establishments employed 2,090 workers, or 1.1% of the total number employed in manufacturing. The annual payroll of the local industry amounted to $10,265,554 in 1951.

The petroleum industry provides an important source of trade for the Port of Baltimore. In 1951 it shipped and received 12,320,825 short tons of petroleum and products.

Within the industry group, the two oil refineries, Esso Standard Oil and Pan American Refining, may be classified as completely port-dependent.

Esso Standard Oil Company. Of the two refineries, Esso is by far the larger. Since petroleum refining is largely a mechanized operation, Esso's work force is able to handle huge quantities of crude oil. Imports of crude oil from Venezuela, Curaçao, and the Gulf Coast are delivered by tankers and super-tankers. About two million gallons of crude oil are daily pumped from tankers at the Company's piers.1/ The crude oil is then refined and processed to obtain gasoline, kerosene, heating oil, fuel oil for industry and shipping, greases and solvents, etc. In the industrial processes, petroleum catalysts and sulfuric acid purchased from local chemical companies are used.

The plant also includes a large motor oil canning facility, which utilizes motor oil delivered by tankers from Esso's plants in New Jersey. Additional supplies of heating oil are also brought in during the winter to meet increased demand.

1/ Interview with Mr. W. H. Long, Public Relations Director, Esso Standard Oil Company, December 19, 1952.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

The Esso refinery normally serves as a distribution center for petroleum products to an important marketing area: Pennsylvania, Delaware, Virginia, West Virginia, North Carolina, South Carolina, and the District of Columbia. However, the territory tributary to any one refining plant tends to shift at times depending on the cost of production for each item at the particular refinery.

Since transportation is such an important item in total production cost, the petroleum industry utilizes water transportation wherever possible in the distribution of its products. For example, petroleum products are sent by lighter to Washington, D. C., although the distance by sea is 180 miles compared to only 40 miles by land.

The plant's waterfront facilities include three oil loading docks at which all types of vessels may bunker directly for fuel oil. The Company also operates tank barges for refueling vessels in the River or at general cargo berths.

In addition to depending on its waterfront location for receipt of raw materials and distribution of products, the Company also satisfies its large water requirements by pumping 120,000,000 gallons daily from the Patapsco River.

Transportation Equipment (Shipbuilding and Repairing)

The transportation equipment industry has in certain years been a serious challenger to the primary metal industry as the leading employer in the Baltimore area. In 1951 due to a sharp increase in aircraft and shipbuilding activities, employment in the 65 local establishments rose to 32,420, representing 17.0% of total manufacturing employment. The industry's payroll amounted to $127,183,988 in 1951. Among the major companies in this industry are: Bethlehem Steel Shipyard at Sparrows Point and its ship repair facility on Key Highway; Maryland Drydock Company; and the Glenn L. Martin Company (included in partially-dependent industries).

Within this industry, the shipbuilding and ship repair activities are most closely linked to the Port. Baltimore is a leading ship construction and repair center. Ships will often make a special trip to Baltimore to put in for repairs.[1]

The industry in 1950 experienced a very serious decline. However, "the entire picture changed radically with the advent of the Korean War. The renovation of ships from the 'Moth Ball Fleet,' more repair work, and orders for construction of small craft brought about a rejuvenation of the ship industry here."[2]

Currently activity is at a high. The Sparrows Point shipyard leads the Nation with 22 merchant ships on order or under construction.[3] The shipyard, utilizing many of the products of the Sparrows Point steel plant, has built super-tankers and cargo vessels, as well as super-ore carriers for its parent corporation.

Food and Kindred Products (Sugar Refining)

Only the sugar refining activities of the food and kindred products industry may be classified as completely port-dependent. The balance of the industry is considered under the discussion of partially port-dependent industries.

As a whole, the industry employed 22,159 persons in 1951, accounting for 11.6% of local manufacturing employment. Of this number, sugar refining employed approximately 5%.

The American Sugar Refining Company operates a large refinery on the waterfront at Locust Point. Employing approximately 1,100 workers, the

---

[1] Interview with Mr. John Aler, Manager, Steamship Trade Association, October 23, 1952.

[2] Annual Report, Export and Import Bureau, Baltimore Association of Commerce, 1950, p. 9.

[3] Baltimore Sun, Sunday, December 15, 1952.

plant is dependent for its continued operations on the raw sugar brought in by ship from Cuba, Puerto Rico, and the Phillippines. Products are distributed by truck, railroad and coastal vessels.

This complete port-dependency of sugar refining was recently brought into sharp focus by the brief shutdown of the American Sugar Refining Company as a result of a strike by a small number of longshoremen specialists.[1/] Five days of picketing exhausted the Company's supply of raw sugar. Production was temporarily halted until the ratification of a new union contract.

Stone, Clay, and Glass Products (Gypsum)

Only gypsum processing, in the stone, clay, and glass products industry, may be considered as completely port-dependent. The major segment of the industry, therefore, is discussed under the section on partially port-dependent industries. As some indication of the relative importance of stone, clay, and glass products to manufacturing employment in Baltimore, it is noted that 3.1% of manufacturing employees were on the industry's payroll in 1951.

The National Gypsum Company opened a $6,000,000 plant in Baltimore in 1947 to bring in gypsum by boat from Nova Scotia and to distribute its products by water and rail. Both the raw material and the finished products are bulky, so that the cost of transportation is a determining factor in plant location.

[1/] Baltimore Evening Sun, January 7, 1953.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

IV. PARTIALLY PORT-DEPENDENT INDUSTRIES

The distinction between complete and partially port-dependent industries is one of degree rather than kind. The partially port-dependent industries may utilize the Port extensively, but do not rely on it wholly for their continued operation, as is the case of completely port-dependent industries. The partially port-dependent industries fulfill some or all of the following conditions:

1. Raw materials, while possibly heavy, are not bulk items.
2. Imported raw materials, while necessary in the manufacturing process, are generally not the sole or major constituent in the manufacturing process.
3. Finished products, while probably heavy, are not bulk cargo.
4. Foreign and domestic markets accessible by water transportation may constitute a significant outlet for finished products.
5. Rapid means of transportation, in certain instances, may be more desirable than low-cost shipping.
6. The industrial water requirements are not unusually large.
7. The economics of the industry do not dictate a waterfront location, although such a site may prove useful.

As a corollary to the foregoing conditions, the partially port-dependent industries may, in the event of a harbor shut-down, be able to utilize temporarily another near-by port for the receipt and shipment of raw materials and finished products.

The partially port-dependent industries in Baltimore are often satellite industries, depending on the products of the basic steel, oil, and chemical industries for the materials and fuel used in manufacturing. This relationship is clearly exhibited by the metal fabricating, machinery, and electrical equipment plants. Some, like the refractories, find a major outlet for their products in the basic industries. It is noteworthy that during the 1952 steel strike in Baltimore, which lasted 58 days, several steel fabricating plants and the two local refractories were forced to slow down or suspend operations.

In general, the following industries can be classified as partially port-dependent: food and kindred products (excluding sugar refining); fabricated metal products; chemicals (excluding industrial and agricultural); machinery (except electrical); electrical machinery, equipment, and supplies; stone, clay, and glass products (excluding gypsum); and transportation equipment (excluding shipbuilding and repairing). The salient facts demonstrating the dependency relationship for each industry are summarized below, using specific companies as illustrations.

Food and Kindred Products (excluding Sugar Refining)

The food industry is the third largest employer in Baltimore; 302 establishments had a combined work force of 22,159 in 1951, or 11.6% of the total employed in manufacturing. The annual payroll of the entire industry totaled $72,579,527 in 1951.

Table 1 lists the variety of food products manufactured in Baltimore by the food companies, which include a number of canneries and meat packers. The largest among these companies are: McCormick, Crosse and Blackwell, Albert F. Goetze, Esskay Products, Corkran Hill, Gibbs, and American Sugar Refining (included in completely port-dependent industries).

The major portion of the meat, fruits and vegetables, and seafood processed in Baltimore's food plants is obtained within the State or from surrounding states. However, such items as spices, flavorings, extracts, coffee, and tea are necessarily imported. The Great Atlantic and Pacific Tea Company, which recently opened a branch plant in Baltimore for coffee roasting, depends heavily on coffee imports. Some of the smaller companies concentrate on importing and processing a few specialty items: J. S. Young imports licorice root; Pompeian Company imports olive oil.

Eleven of the companies are located directly on the waterfront. A number of the others are close by. These sites combine the advantages of easy accessibility to marine transportation as well as to establishments manufacturing tin cans and other types of containers. Several companies manufacturing canning and bottling machinery are also located in the area. Packaging items, such as labels and boxes, are also readily available from local firms. In addition, sugar supplies for beverages and syrups are easily obtained from the Locust Point plant of the American Sugar Refining Company.

Finished products are distributed by truck, rail, and ship. McCormick and Crosse and Blackwell report an international market for their products. The large meat packing establishments also ship canned products abroad.

The dependence of the food canning industry, however, upon water transportation seems to be declining. The new Chesapeake Bay Bridge is responsible for the substitution of trucks for lighters and barges in carrying Eastern Shore farm and seafood products to Baltimore canneries.1/

1/ Interview with Mr. Michael Murray, Chief, Commercial Statistics Section, Baltimore District Headquarters, U.S. Army Corps of Engineers, December 3, 1952.

There has been a corresponding decline in coastal traffic. "Volumes shipped in coastwise trade were in the neighborhood of 200 million pounds during the years immediately preceding World War II, representing five per cent or more of coastwide shipping... About 54 million pounds were shipped in 1949 and in 1950." 2/ The competition offered by southern and western canneries as well as the increased preference for more direct and rapid means of transportation probably account for the decrease in coastal shipment of food products.

Fabricated Metal Products (except Ordnance, Machinery, and Transportation Equipment)

The fifth ranking manufacturing group in Baltimore is the metal fabricating industry. There were 168 establishments employing 16,028 workers in 1951, or 8.4% of the total in manufacturing. The total annual payroll for the industry was $57,121,918 in 1951.

The largest of the partially port-dependent companies are: Crown Cork and Seal, American Can, Continental Can, Federal Tin, Anchor Post Products, American Radiator and Standard Sanitary, and Rheem Manufacturing. Their products, as listed in Table 1, include a variety of items, such as bottle tops, tin cans, and steel drums.

Steel, the basic material required by all these metal fabricating plants, is readily available from the Sparrows Point steel plant. In fact, several of the newer companies, like Rheem and Signode Steel Strapping, were attracted to the Dundalk area by the proximity of Bethlehem Steel plant. Others, like Crown Cork and Seal, find the local supply of steel a decided asset. Tinplate is another Bethlehem product which is purchased by the local can manufacturers.

2/ University of Maryland, Studies in Business and Economics, Baltimore in Coastwide Trade, vol. 6, no. 2, September 1952, p. 11.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Only one metal-working establishment, Continental Can, is located on the waterfront. Imports, exclusive of a few selected items are not too important to this industry. Probably the largest single importer is Crown Cork and Seal, which receives a weekly shipment of cork from Spain and Portugal. In 1951, it imported a total of 21,000 tons of cork. It also imports flaxseed, paper pulp, and tin.

The Port is utilized more extensively by the industry in distributing its products to domestic and foreign markets. Crown Cork and Seal exports bottling machinery as well as bottle caps. The can companies also do a considerable export business.

American Radiator and Standard Sanitary utilizes combined water-rail transportation as the cheapest means of obtaining pig iron from Birmingham, Alabama. The iron is shipped via rail to Norfolk and barged up the Chesapeake to Baltimore. Since the domestic market currently consumes almost the entire output of the local plant, the Company's exports are negligible.

Chemicals and Allied Products (excluding Industrial and Agricultural)

Excluding industrial and agricultural chemical products (covered in the discussion of completely port-dependent industries), the chemicals and allied products industry may be classified as partially port-dependent. For the year 1951, the entire industry, comprising 148 establishments, employed a total of 10,442 persons, with an annual payroll of $39,616,650. Two major segments of the chemical industry, represented in Baltimore, are paints and pigments, and soap and products.

Paints and Pigments. There are several large paint and pigment manufacturers in Baltimore, including the Chemical and Pigment Division of the Glidden Company, the E. I. du Pont de Nemours Company, and the

H. B. Davis Company. Glidden and E. I. du Pont de Nemours, located on the waterfront, were formerly large importers of ilmenite, an ore used in manufacturing titanium dioxide, a white pigment. The development of domestic sources has reduced imports of the ore. However, Glidden still imports 20,000 tons of barytes ore annually from Europe. The companies purchase their supply of sulfuric acid from Davison and Mathieson, another example of the effective operation of Baltimore's industrial network. The du Pont Company ships its products to the Pacific Coast, Canada, Mexico, and South America.

Soap and Products. The manufacture of soap and products constitutes another important segment of the chemical industry in Baltimore. Copra is imported from the Phillippines, but other major raw materials can be obtained locally. Lever Brothers and Proctor and Gamble chose Baltimore plant locations for the good transportation facilities afforded, as well as marketing opportunities in the region.

Machinery (except Electrical), and Electrical Machinery, Equipment, and Supplies

Since these two industry groups are closely akin in their relationship to the Port, they have been combined for purposes of analysis.

The machinery (except electrical) industry employed 9,988 workers in 121 establishments in 1951. With an annual payroll of $38,561,048, the industry employed 5.2% of all manufacturing workers in Baltimore, for the year 1951.

Leading products of the machinery industry include gas manufacturing and storage apparatus; canning, baking, and bottling equipment; and dredging equipment.

The largest companies in Baltimore are Black and Decker, and Koppers, each averaging more than 1,000 workers. The other companies

are small-scale enterprises, usually not exceeding 100 employees.

The electrical machinery, equipment, and supplies industry, with 30 establishments, employed 11,490 in 1951. Accounting for 6.0% of total manufacturing employment, the industry had an annual payroll of $47,168,640 in 1951. The two large electrical equipment companies in Baltimore, Western Electric and Bendix Radio, have an average labor force of approximately 4,000.

Only three of the companies in these two industry groups have waterfront sites: Western Electric, Ellicott Machinery, and Edward Renneburg.

Few of the companies, exclusive of Western Electric, are importers of raw materials. Western Electric imports jute from India, lead from Mexico and Australia, and rubber from the East Indies. However, the Port is utilized more extensively by these companies in the export of finished products. Not only does Western Electric load outgoing cargoes of cable from its own docks abroad ships, lighters,and barges, but Bendix Radio reports that it exports 40% of its products, particularly radar equipment. Reid Avery, manufacturer of electrodes for electric arc welding, distributes its products widely in the foreign markets. The Company states that the availability of intercoastal shipping enables it to meet the competition offered by midwestern producers.

A number of the companies fill their steel requirements locally. Reid Avery and Proctor Electric were attracted to Baltimore because of this advantage. Western Electric also purchases copper and industrial chemicals locally.

Stone, Clay, and Glass Products (excluding Gypsum)

Sixty-six establishments, comprising the stone, clay, and glass

industry, had a total labor force of 5,863 in 1951; this represented 3.1% of the total employed in manufacturing. Including gypsum processing, considered under the completely port-dependent industries, the over-all stone, clay, and glass industry had a total payroll of $20,790,293 in 1951.

Refractory bricks, glass bottles and other glass items, porcelain frit, porcelain electrical insulators, wall board, and other building materials represent the major products of this industry. The leading companies are Harbison-Walker Refractories, General Refractories, Carr-Lowrey Glass, Buck Glass, Pemco, Locke Division of General Electric, and National Gypsum.

Three of the companies, Harbison-Walker, Carr-Lowrey, and National Gypsum (classified as completely port-dependent) are located on the waterfront. Carr-Lowrey states that it no longer finds its waterfront site of particular value. However, the other major companies utilize the Port for importing raw materials or exporting finished products.

Refractory brick is used in lining furnaces heated to extremely high temperatures; the industry's principal customers are therefore steel and other metal refiners. Both the raw materials and finished products involve huge tonnages; therefore refractory plants are usually located near large consumers, and if possible, close to good, inexpensive transportation facilities. Baltimore enables the companies to enjoy all these advantages.

The industry consumes large quantities of chrome ore imported from the Phillippines and Cuba, magnesite shipped intercoastally from the State of Washington, and olivine brought in by rail from New Jersey. The refractory products are sold to Bethlehem Steel and other customers in the area.

The other companies in this industry classification, with the exception of National Gypsum, are able to obtain most of their raw materials in Maryland and the surrounding area, but find their port location important to their export business. The Buck Glass Company, which manufactures milk and soft drink bottles, ships its products to Norfolk and other near-by points via the Chesapeake. The Locke Division of General Electric, which manufactures porcelain electric insulators, exports its products by coastal and intercoastal vessels. Transportation costs are an important consideration with this company since they constitute ten to fifteen per cent of the total cost of production. Similarly, the Pemco Company reports extensive use of water transportation in the distribution of its products at home and abroad.

Transportation Equipment (excluding Shipbuilding and Repairing)

The salient facts concerning this industry have already been summarized in the previous section on completely port-dependent industries, with special emphasis on shipbuilding and repairing. The other two major categories in this industry classification, which operate in Baltimore, are automobiles and aircraft, both of which are partially port-dependent.

The local Chevrolet and Fisher Body divisions of General Motors, which assemble cars and trucks, employ several thousand workers. Serving as a distribution center for dealers in Maryland and near-by states, the Chevrolet Division also exports vehicles via the Port of Baltimore.

The Glenn L. Martin Company, located in Middle River, finds its tidewater location particularly advantageous for developing and testing seaplanes. In this sense, the Company follows the pattern of the shipbuilding and repairing group in its site requirements, although to a lesser degree.

V. PORT-SERVICED INDUSTRIES

While port-serviced industries may utilize the facilities of the Port, the economic and technological conditions governing their operations do not demand either a waterfront site or location in a port. For many of the individual port-serviced firms, the advantages which are obtained by location in a tidewater area might be outweighed at another time by compensating features offered elsewhere. For example, the textile industry, although represented in Baltimore, is concentrating in southern cities which offer special inducements such as, lower wage scale, tax exemptions, and municipally-financed plants.

In general, therefore, the port-serviced industries, as contrasted with the completely or partially port-dependent industries satisfy the following conditions:

1. Neither the raw materials nor the finished products are usually as heavy or bulky as those handled by the completely and partially port-dependent industries.
2. Imports of certain raw materials may be necessary in particular cases, but not as a general rule.
3. Exports generally are not a significant percentage of total output.
4. Transportation costs are not usually an important constituent of total cost of production.
5. Products may be manufactured primarily for local use by other port-linked industries.

The following industries in Baltimore fulfill some or all of the above conditions:

[illegible]

[illegible]

[illegible]

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]

[illegible]

1. textile mill products
2. apparel and other finished products
3. lumber and wood products (except furniture)
4. furniture and fixtures
5. paper and allied products
6. printing, publishing, and allied industries
7. rubber products
8. leather and leather products
9. professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks
10. miscellaneous manufacturing industries

These industries in 1951 encompassed 1,004 establishments, with 49,272 employees and a total combined payroll of $149,220,660. This represented 25.8% of employees in manufacturing and 21.8% of the total payroll. The apparel, paper, and printing industries are the largest of the port-serviced industries.

Only two of the 1,004 establishments classified as port-serviced are located on the waterfront, a lumber concern and a paper box manufacturer. Table 1 lists the variety of items imported and exported by the port-serviced industries. In contrast to the imports of the completely port-dependent industries, these imports are often semi-finished or processed materials. Certain of the firms utilize the Port to a greater extent than others. For example, tons of wood pulp and newsprint for the paper and publishing industries are imported from Canada. Crude rubber imports are important to the Holtite Rubber Company, a large manufacturer of rubber heels and soles.

Baltimore is also an important scrap center for paper and textiles, as well as metal.[1] A number of firms in the textile industry engage in the import and export of rags, cotton, and woolen waste, in addition to industrial wiping cloths.

---

[1] Interview with Mr. George Creighton, Chief, Industrial Bureau, Baltimore Association of Commerce, October, 1952.

VI. ECONOMIC IMPACT OF PORT-LINKED MANUFACTURING INDUSTRIES

Employment Provided by Port-Dependent and Port-Serviced Industries

All the major manufacturing industries in Baltimore, with the exception of the apparel industry, fall within the port-dependent (complete and partial) categories. In 1951, the port-dependent industries included 956 establishments with 141,740 employees and an annual payroll of $535,523,787.[1/] The port-serviced industries covered 1,004 establishments with 49,272 workers and an annual payroll of $149,220,660.

The port-dependent industries included 48.7% of the total manufacturing establishments, employing 74.2% of the total workers, and paid 78.2% of the annual manufacturing payroll. The port-serviced industries, while covering 51.1% of the manufacturing establishments, employed only 25.8% of the total employees and contributed only 21.8% of the total annual manufacturing payroll. On a percentage basis, the employment and payroll figures for the port-dependent industries showed a slight increase from 1949 to 1951, whereas the port-serviced industries recorded a slight loss.

The port-dependent industries provided approximately three fourths of the manufacturing employment and payroll in Baltimore; the port-serviced industries, only one quarter. It is obvious that the port-dependent industries far outdistanced the port-serviced industries in their support of the community's economic base.

When the port-dependent industries are ranked according to employment, the order is as follows: primary metals, transportation equipment,

---

[1/] The figures for the completely and partially port-dependent industries were combined because these statistics were prepared on an industry basis rather than divided into the industry sub-classifications used in preparing the three categories of port-linked manufactures.

food, metal fabrication, electrical machinery, and chemicals.[1]

Employment Provided by Port-Linked Establishments

Although generally meaningful, the above industry figures do not reflect fully the importance of port-linked industries to the community. There are significant variations in the degree to which individual firms within each port-linked industry utilize the Port. On a qualitative basis, these variations have been taken into account in classifying the port-linked industries as: completely port-dependent, partially port-dependent, and port-serviced. In addition, there are a number of firms in each industry which do not utilize port facilities and derive no benefit from their location in a port area.

Using the Classified Directory of Baltimore Firms in International Commerce, prepared by the Baltimore Association of Commerce, it was possible to make a count of the number of firms in each industry, which are actually port-linked. (See Table 3.)

Out of a total of 1,964 manufacturing establishments in 1951, 203 used the Port to import or export goods. These firms employed 121,250 out of a total of 191,130 in manufacturing and had a annual payroll of $456,522,931. In summary, the port-linked establishments accounted for 63.4% of the total manufacturing force and 66.6% of the total manufacturing payroll.

---

[1] Although employment in the transportation equipment industry exceeded employment in the primary metal group in 1951, the latter has been listed as the leading employer because it has maintained that rating more consistently over the years than the transportation equipment industry.

TABLE 3

COMPARISON OF EMPLOYMENT AND PAYROLL FOR PORT-LINKED ESTABLISHMENTS IN BALTIMORE METROPOLITAN AREA, 1951*

Classification	Number of Establishments		Employment		Payroll	
	Port-Linked	% of All Manufacturing	Port-Linked	% of All Manufacturing	Port-Linked	% of All Manufacturing
Food & Kindred Products	39	12.9	11,476	51.8	$ 39,660,454	54.6
Textile Mill Products	9	30.0	2,354	60.0	6,624,533	58.1
Apparel & Other Finished Products	16	48.6	2,490	14.2	6,632,929	14.3
Lumber & Wood Products	7	7.6	452	22.6	1,745,032	27.9
Furniture & Fixtures	5	5.2	2,042	44.9	5,105,048	38.1
Paper & Allied Products	8	17.0	1,170	29.2	4,887,265	37.6
Printing, Publishing, & Allied Industries	6	2.3	1,063	11.7	3,691,616	10.8
Chemicals & Allied Products	34	23.0	8,949	85.7	33,286,754	84.0
Products of Petroleum & Coal	2	15.4	1,690	80.9	8,702,292	84.8
Rubber Products	2	12.1	484	15.8	1,626,534	18.5
Leather & Leather Products	2					
Stone, Clay, & Glass Products	11	16.7	4,015	68.5	14,294,858	68.8
Primary Metal Industries	5	11.6	29,570	94.6	116,226,392	95.1
Fabricated Metal Products	16	9.5	12,523	78.1	46,264,396	81.0
Machinery (except Electrical)	16	13.2	5,138	51.4	19,596,257	50.8
Electrical Machinery, Equipment, & Supplies	5	16.7	8,342	72.6	33,924,995	71.9
Transportation Equipment	6	9.2	27,041	83.4	106,884,142	84.0
Instruments & Related Products	4	16.0	1,099	77.3	3,757,534	79.2
Miscellaneous Manufactures	10	11.1	1,352	37.1	3,611,900	33.0
Total Port-Linked Establishments	203	10.3	121,250	63.4	$456,522,931	66.6

Source: Maryland Department of Employment Security.

* Fourth quarter 1951.

Major Port-Linked Industries, According to Payroll

One of the measurements of industry dependence on the Port is the ratio between the employment and payroll of the port-linked firms in each industry to the total payroll for the industry as a whole. On this basis, the following industries exhibit a high degree of port attachment in that more than three quarters of their payroll are attributable to port-linked establishments: primary metal industries (95.1%); products of petroleum and coal (84.8%); chemicals and allied products (84.0%); transportation equipment (84.0%);fabricated metal products (81.0%); professional, scientific, and controlling instruments (79.2%).[1] For the year 1951, the payroll of port-linked firms in these six industries totaled $315,121,410.

Measurement of Waterborne Commerce

In order to assess the contributions made by port-linked establishments to Bort activity, it would also be desirable to determine how much of Baltimore's waterborne commerce is attributable to them; for example, what percentage of the iron ore received in Baltimore is intended for the Sparrows Point steel mill, or similarly, how much of the electrical equipment exported through the Port is manufactured locally.

Answering these and similar questions, however, has not been possible during the present study. Neither official nor private sources have systematically collected the necessary statistical information. Attempts to gather data from some of Baltimore's leading companies in the course of this study proved unfruitful.

Yet determining the percentage of waterborne commerce traceable to manufacturing activity in the Metropolitan Area is obviously essential in answering important economic questions, e.g. the economic impact of the St. Lawrence Seaway on the Port of Baltimore, or of eliminating favorable freight differentials (currently at stake for grain and iron ore).

1/ See Table 3 for complete listing by industry.

In fact, the interest manifested by civic, private, and government officials in this question suggests that provisions should be made to collect the necessary information from the individual manufacturing firms. Probably the Foreign Trade Division of the Bureau of the Census is best equipped to take on this assignment.

VII. OPPORTUNITIES FOR INDUSTRIAL EXPANSION

Improved harbor facilities for the shipments of general cargo and solicitation of general cargo from the freight territory tributary to the Port of Baltimore are some of the recommended measures which have received attention in previous studies of the Port. It follows, therefore, that efforts should also be directed toward attracting new industries and expanding established ones which will produce commodities that can be shipped via water, as general cargo.

Certain significant facts emerge after surveying the manufacturing industries. Baltimore, despite the advantages offered by availability of raw materials, good transportation, a heavily populated marketing area, accessibility of foreign and other domestic markets through the Port, and an adequate labor supply, has failed to develop an industry devoted to consumers' electrical goods and appliances. Excluding the radio and television products manufactured by Bendix Radio, there is little, if any, production of many of the other items included in this category, for example, refrigerators, toasters, vacuum cleaners, and washing machines. Although the Proctor Electric Company, manufacturer of consumers' electrical goods, opened a branch plant in Baltimore in 1949, that plant is a comparatively small organization producing ironing boards and heat controls for electric blankets. Both General Electric and Westinghouse have branch plants in Baltimore, but neither manufactures consumer goods.

Similarly, there is an absence of companies engaged in the manufacture of heavy machinery and industrial equipment, for example, machine shop equipment, power producing equipment like turbines and generators; and agricultural implements.

The reasons for the underdevelopment in these fields are not readily apparent.

There is apparently a time lag between the development of a local steel industry and the subsequent growth of satellite industries. It is possible that with the heavy concentration of these particular industries in the New York and Philadelphia port areas, the opportunities in Baltimore may have been overlooked.

The production of synthetic fabrics offers another interesting possibility. Baltimore, with a large local chemical industry and only a short distance from Wilmington, center for the du Pont works, might well seek to expand the production of synthetic fabrics locally. The large clothing industry located both in New York and Baltimore, plus the accessibility of foreign ports, might serve as further inducements. It is noteworthy that in 1948, the Mount Vernon-Woodbury Mills, in Baltimore, were converted to the production of synthetic fabrics.

With respect to bulk cargo, the feasibility of attracting additional petroleum refineries to the Port of Baltimore merits further study. Whereas iron ore is important only in import traffic, the shipments of crude petroleum and its products contribute to all Port traffic, foreign, coastal, internal, and local. A total of 12,320,825 short tons was shipped through the Port in 1951, or 28.7% of total Port tonnage. The entire cargoes originated in or were destined for the two local refineries and the petroleum-products receiving stations on the waterfront. However, in the postwar years, Baltimore has received percentagewise a smaller share of the crude petroleum imports flowing to the Atlantic Coast, especially when contrasted with Philadelphia. One explanation for Baltimore's loss of this cargo may be the limitation of the local refineries for handling additional receipts.

SUMMARY AND CONCLUSIONS

1. The manufacturing-shipping relationship is not static, but reflects changes in economic and technological conditions.

2. All manufacturing industries in Baltimore are port-linked, with the exception of tobacco manufacture, which is of minor significance.

3. Port-linked industries can be divided into three categories: completely port-dependent, partially port-dependent, and port-serviced.

4. Completely port-dependent industries generally need waterfront sites to minimize transportation costs on bulky raw materials and finished products; raw materials are often imported from foreign sources; an unusually large supply of water may be required for industrial purposes; some industries, like shipbuilding and repairing, require a waterfront site for manufacturing purposes.

   Included in the completely port-dependent industries are: primary metals; industrial and agricultural chemicals; petroleum refining; shipbuilding and repairing; sugar refining; and gypsum products.

5. Partially port-dependent industries find a port location valuable mainly because they export, although some industries are also dependent on imports of heavy raw materials; they do not generally require a waterfront site, but as satellite industries, location in the harbor area facilitates

buying from or selling to the basic industries located on the waterfront, i.e. steel, chemicals, and petroleum.

The following industries are partially port-dependent: food and kindred products (excluding sugar refining); fabricated metal products; chemicals (excluding industrial and agricultural); machinery; electrical products; stone, clay, and glass (except gypsum); and transportation equipment (excluding shipbuilding and repairing).

6. Port-serviced industries find the availability of water transportation useful, but not necessary; raw materials and finished products are generally not bulky, so that transportation cost is not a major cost item; foreign sources of raw materials and foreign markets generally are a secondary factor in plant site selection.

The following industries are considered port-serviced: textiles mill products; apparel and other finished products; lumber and wood products; furniture and fixtures; paper and allied products; printing, publishing, and allied industries; rubber products; leather and leather products; professional, scientific, and controlling instruments; and miscellaneous manufactures.

7. For the year 1951, port-linked establishments accounted for an annual payroll of $456,522,931, representing two thirds of the total manufacturing payroll in the Baltimore Metropolitan Area. The number of employees in the port-linked establishments averaged 121,250.

8. The regular compilation of statistical data on the domestic origin of exports and the domestic destination of imports, by the United States Bureau of the Census, would enable further study of the Port's economy and the impact of proposed improvements.

9. The following industries are not represented or are underdeveloped in Baltimore: consumers' electrical goods and appliances, heavy industrial machinery and equipment, agricultural implements, and synthetic fabrics. Attracting these industries to Baltimore would be mutally advantageous.

10. There are only two local petroleum refineries. The feasibility of expansion of the petroleum refining industry in Baltimore merits further study.

BIBLIOGRAPHY

1. Port of Baltimore

Baltimore Association of Commerce and the Steamship Trade Association of Baltimore, *Port of Baltimore Handbook*, 2nd ed., March 1952.

Baltimore Association of Commerce, *The Port of Baltimore Through Two Hundred Year*, 1947.

Knappen Tippetts Abbett Engineering Co., *Report on the Port of Baltimore*, 2 vol., 1950.

E. J. Long, "Baltimore, 'Farthest Inland' Atlantic Port," *Ships and the Sea*, vol. 2, no. 5, October 1952, p. 12.

U. S. Army, Corps of Engineers, *The Port of Baltimore*, Port Series No. 16, rev. 1939, 1940.

U. S. Army, Corps of Engineers, *The Port of Baltimore*, Port Series No. 10, rev. 1946, 1947.

University of Maryland, Bureau of Business and Economic Research, Studies in Business and Economics,
Baltimore in Export Trade, vol. 5, no. 2, September 1951.
Baltimore in Import Competition, vol. 5, no. 3, December 1951.
Baltimore in Coastwide Trade, vol. 6, no. 2, September 1952.

U. S. Department of State, *Maryland in Foreign Trade*, 1952.

2. Baltimore's Industries

Consolidated Gas and Electric Company, *Second Industrial Survey of Baltimore, 1914-1939*, 1939.

Consolidated Gas and Electric Company, "Industry Looks at Baltimore's Opportunities," Series 1-4, 1948-1950.

Maryland State Planning Commission,
Location Factors in Establishing New Manufacturing Firms in Maryland, 1951.
Growth of Manufactures in Maryland, 1921-1947, 1951.
Survey of the Impact of F.O.B. Mill Pricing on Maryland Manufacturers, 1949.
Report on the Iron and Steel Industry of Maryland - Blast Furnaces, Steel Works and Rolling Mills, 1938.
Report on the Fertilizer Industry, 1938.

BIBLIOGRAPHY (cont'd)

Baltimore Association of Commerce,
Classified Directory of Baltimore Firms in International Commerce, 1951.
Baltimore, monthly publication.
Baltimore-Its Supporting Economy.
Baltimore's Business Expansion Program.

Maryland Department of Information, *Industrial Maryland*, 1948.

Bethlehem Steel Company, *Looking at Baltimore*, 1952.

Bethlehem Steel Company, *Sparrows Point Plant*.

Mathieson Chemical Co., *Mathieson Chemicals*.

Baltimore Esso Refinery, *The Story of the Baltimore Refinery*.

3. *General Information, Statistics*

U. S. Bureau of the Budget, *Standard Industrial Classification Manual* vol. 1, Pts. 1 and 2, Manufacturing Titles and Description, 1945.

U. S. Department of Commerce, Bureau of the Census, *Census of Manufactures: 1947*, vol. 3.

1950 Census of Population, Maryland: General Characteristics.

Maryland Department of Labor and Industry, *Directory of Maryland Manufacturers*, 1949, 1950.

U. S. Department of Commerce, *Statistical Abstract*, 1949, 1950, 1951.

Directory of Central Atlantic States Manufacturers, 1953, Baltimore, T. K. Sanderson Org.

U. S. Department of the Army, Chief of Engineers, *Annual Report, Pt. 2 Waterborne Commerce of the United States*, 1949, 1950.

U. S. Department of Commerce, Area Development Division, *Basic Industrial Location Factors*, 1947.

American Society of Planning Officials, *Municipal Waterfronts: Planning For Commercial And Industrial Uses*, Information Report No. 45, December 1952.

APPENDIX A

PORT DEVELOPMENT PROPOSALS FOR 1953

December 3, 1952

Mrs. Thelma S. Nason
Maryland State Planning Commission
100 Equitable Building
Baltimore 2, Maryland

Dear Mrs. Nason:

In accordance with your request on December 2, 1952, there is submitted herein, for use of the Maryland State Planning Commission, a resume of port development proposals and possible expenditures thereon for port development during the year 1953 as a result of loans of development funds secured through the sale of Baltimore City certificates of indebtedness.

You will note that the words "possible expenditures" are used. This is so since under the basic legislation of the State of Maryland and City ordinances establishing the Port of Baltimore Commission, there is no compulsion for the borrowers of the funds to expend them immediately. As an illustration, the contract to be shortly made between the City and the Western Maryland Railway Company, about which I talked with you, involving a $12,000,000 loan of port development funds for new terminal facilities at Port Covington, permits the Railway Company to request and expend portions or all the funds within a five-year period from the date of the contract. Although it is probable that a portion of the $12,000,000 will be requested to be made available and will be expended by the Railway Company during the first year of the contract, it is unlikely that the total amount will be requested the first year due to the magnitude of the work. It is more likely that the expenditures of the funds and the construction will be spread over a period on the order of four years.

There are five firm port development propositions before the Port of Baltimore Commission at the present time involving a total of $40,500,000 in proposed loans by the City. All are under study but only one is approaching an early conclusion — that of the Western Maryland Railway Company. The five proposals are listed below including a brief description of the proposed facilities and the amount of money involved.

Western Maryland Railway Company — Entails construction of a new large general merchandise pier and supporting facilities, enlargement of existing piers and a transit shed, and new rail support yards, all at Port Covington. Proposed loan - $12,000,000.

[illegible]

[illegible]

[illegible]

[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Baltimore Port & Terminal Corporation -- Entails construction of a new ore terminal and new general merchandise pier with supporting facilities at Point Breeze, Baltimore. Proposed loan - $15,000,000.

The Canton Railroad Company -- Entails reconstruction and modernization of Pier 11 at Lower Canton, Baltimore. Proposed loan -- approximately $4,000,000.

The Pennsylvania Railroad Company -- Entails construction of a new general merchandise pier at the present site of Pier 5, Clinton Street, Baltimore. Proposed loan -- $9,000,000.

Victor Lynn Lines, Inc. -- Entails construction of a truck terminal and a wharf at a location which the Commission is assisting to find. Proposed loan -- $500,000.

Although the five proposals shown above involve a total of $40,500,000 in proposed loans for port development, only $31,000,000 is available to the City and Port of Baltimore Commission for this purpose at this time. From this it is obvious that it would be necessary for the Port of Baltimore Commission to determine which of the proposals will be the most advantageous for construction with loan funds.

In addition to the firm proposals now under consideration by the Commission, another company has tentatively submitted a proposition for reconstructing an existing pier for use as a warehouse at a cost of $1,500,000. At the request of the proponent, the Commission has delayed any action on the proposal until such time as the proponent can submit firm data in support of the proposition.

It is hoped that the above information will be helpful to the State Planning Commission in its study of the relationship between the industries of Maryland and the Port of Baltimore.

Very truly yours,

/S/ James W. Davis

James W. Davis, Director
Port of Baltimore Commission
300 Municipal Building
Baltimore 2, Maryland

JWD:csb

[illegible]

Vld
509.1752
n36p
80